Michigan WIC Anthropometric Measurement Procedures
APPENDIX A: GLOSSARY OF TERMS

Accuracy	Degree to which a measurement of a person corresponds to his/her actual weight or height (length or stature).
Anthropometry	Body measurements consisting of length or stature, head or arm circumference, weight and skin fold.
Beam-Balance Scale	A weighing device characterized by having a set of sliding weights to counterbalance the object being weighed.
Body Mass Index (BMI)	An anthropometric index of weight and stature that is defined as the weight in pounds divided by the stature in inches squared multiplied by 703. Like weight for length, BMI-for-age is a screening tool used to identify individuals who are underweight or overweight.
Health Professional	For the WIC Program, the term refers to a Competent Professional Authority (CPA).
Height	General term use to describe length or stature.
Length	Distance from the crown of the head to the bottom of the feet when the subject is measured supine.
Pattern of Growth	Progress of physical growth impacted by heredity and environment (health, food and socioeconomic factors). When a child is well, growth is sequential. During acute illness, growth rate will be depressed. The best interpretations of a child's growth are made from several observations made over time rather than body measurements made at a single point in time. Measurements taken at different times permit calculations of growth over that defined time period. One time measurements give only size.
Precision	Degree to which successive measurements of the same child agree within specified limits.
Recumbent	Lying down, on either front or back of body.
Stature	Distance from the crown of the head to the bottom of the feet when the subject is measured **standing**.
Supine	Lying on the back.
Zeroed Scale	The condition of a scale being in balance when there is nothing being weighed and the sliding weights are directly over their respective zeros.

APPENDIX B: EQUIPMENT SOURCES AND STANDARDS

Measuring Head Circumference

- Insertion tape readable to nearest 1/16 inch.

OR

- Disposable paper tape readable to nearest 1/8 inch.

Several pharmaceutical companies print disposable paper measuring tapes as a service to health professionals. These tapes are available from the Mead Johnson Nutritional Division and Ross Laboratories.

Ross Laboratories has available a non-stretch head circumference tape known as Inser-Tape. Perspective Enterprises also has available for purchase, a flexible plastic insertion tape for head circumference measurements. These tapes are reusable and can be cleaned with alcohol.

Measuring Weight

Beam-balance scales (non-detachable weights with a zero adjustment weight, and **WITHOUT** built-in measuring rods).

- Pediatric beam-balance or digital scale that weighs in 0.01 kg (10 gm) or ONE (1) ounce increments.

- Adult beam-balance or digital scale in 1/4 pound (or 0.2 pound) or 0.1 kg (100 gm) increments.

CDC checklist indicates the following Infant Scale checklist:

A scale for weighing infants should have a large enough tray to support the infant and weigh to 20 kg or 40 lb.

High quality beam balance or electronic digital

- Weighs to 20 kg or 40 lb
- Weighs in 0.01 kg (10 gm) or 1/2 oz increments (note: MI WIC allows 1 oz.)
- Tray large enough to support the infant
- Can be easily 'zeroed' and checked
- Weight can be 'locked' in
- Can easily be 'tared' to zero
- Can be read at 'eye level' of measurer
- Can be calibrated
- Motion detector and stabilizer
- No length device attached

Spring balance scales, such as bathroom scales, are not appropriate and should not be used. Over time, the spring counterbalance mechanism loses its accuracy.

Recommended scale models:

1. Pediatric Scales

2. Adult Scales

Since equipment changes frequently, specific models are no longer recommended. See the following for 'Clinic quality' equipment:

http://www.perspectiveent.com/

Perspective Enterprise
7829 Sprinkle Rd.
Portage, MI 49002
1-800-323-7452
Fax: 269-327-0837

Standard Weights

- Clinic scales need to be tested for accuracy at least once a year. This is done by weighing with a number of standard weights.

- Agencies wishing to purchase standardized test weights can purchase them from various scale distributors, such as Z-Weigh, Inc., 5321 Hill 23 Drive, Flint, MI 48507; Pike William Co., 7741 Dix, Detroit, MI; Perspective Enterprise, 7829 Sprinkle Road, Portage, Michigan 49002.

- Agencies can have their scales calibrated annually by a scale service company, such as Toledo Scales.

Measuring Length

CDC recommended: **Infant Lengthboard Checklist**

Length boards for infants must be sturdy, easily cleaned and specific to the purpose and have:

- A firm, inflexible, flat horizontal surface with a measuring tape in 1 mm (0.1 cm) or 1/8 inch increments.
- Tape is stable and easy to read.
- An immovable headboard at a right angle to the tape.
- A smoothly moveable footboard, perpendicular to the tape.

Infantometers are not recommended. Over time, the hinges lose screws and bend out of shape and no longer maintain a right angle to the ruler. Also, they are difficult to operate and to obtain an accurate measurement.

Infant recumbent length boards are available from Perspective Enterprises, 7829 Sprinkle Road, Portage, MI 49002. Contact them at 1-800-323-7452, or Fax to (616) 327-0837.

Measuring Stature

- Steel tapeline readable to nearest 1/16 inch and at least 75 inches long.
- Moveable headboard.

OR

- Wall mounted stature measurement board with permanently attached headboard. The tape line should be readable to nearest 1/16 inch and at least 75 inches long.
- Make certain the stature board and the foot board are mounted so that a small child can stand straight with heels and buttocks aligned vertically. Some stature boards may require a footboard and extension to measure small children.

Source for right angle headboard and a wall mounted stature measurement board is Perspective Enterprises, 7829 Sprinkle Road, Portage, MI 49002. Phone number: 1-800-323-7452. Replacement steel tapelines are available at hardware or department stores.

Determining Gestational Age

Several pharmaceutical companies and the American College of Nurse-Midwives produce gestational wheels as a service to health professionals. Examples of gestational wheels are pictured in Appendix K. Follow the instructions on the back of the wheel for determining gestational age.

APPENDIX C: RECORDING MEASUREMENT VALUES

CDC GROWTH CHARTS AND PRENATAL WEIGHT GRID

Weight - Pediatric Scale

- Write measurement values in pounds, ounces and fractions.

- Example: Weight of 20 pounds, 5 3/8 ounces - record on Recording Form as 20-5 3/8
  Weight of 28 pounds, 12 6/8 ounces - record on Recording Form as 28-12 6/8

Weight - Adult Scale

- Write measurement values in pounds and fractions.

- Example: Weight of 52 3/4 pounds - record on Recording Form as 52 3/4
  Weight of 155 1/4 pounds - record on Recording Form or prenatal grid as 155 1/4

Length/Stature

- Write measurement values in inches and fractions.

- Example: Length of 24 2/16 inches - record on Recording Form as 24 2/16
  Length of 30 2/8 inches - record on Recording Form as 30 2/8

  Stature of 5 feet 5 1/2 inches - record on prenatal grid as 65 8/16
  Stature of 46 inches - record on Recording Form as 46 0/16

Head Circumference

- Write measurement value in inches and fractions.

- Example: Head circumference of 13 12/16 inches - record on Recording Form as 13 12/16
  Head circumference of 15 5/8 inches - record on Recording Form as 15 5/8

APPENDIX C: RECORDING MEASUREMENT VALUES - continued

DATA ENTRY SYSTEM: MI-WIC

Weight - Pediatric Scale

- Enter actual pounds (use 3 digits), ounces (use 2 digits) and round ounce fraction to nearest ounce
- Example: Weight of 20 pounds 5 3/8 ounces-enter on MI-WIC as 20 pounds-5 ounces
  Weight of 28 pounds 12 6/8 ounces-enter on MI-WIC as 28 pounds-13 ounces

Weight - Adult Scale

- Enter actual pounds (use 3 digits) plus ounces (use 2 digits)*
- Example: Weight of 52 3/4 pounds-enter on MI-WIC as 52 pounds - 12 ounces
  Weight of 155 1/4 pounds-enter on MI-WIC as 155 pounds-4 ounces

*It is necessary to change the pound fraction to ounces:

1/4 pound - enter as 04 ounces
2/4 pound - enter as 08 ounces
3/4 pound - enter as 12 ounces

Length/Stature

- Enter inches and fraction in sixteenths**
- Use 2 digits for inches and for fraction
- Example: Length of 24 2/16 inches-enter on MI-WIC as 24 inches-2
  Length of 30 2/8 inches-enter on MI-WIC as 30 inches-4
  Stature of 5 feet 5 1/2 inches-enter on MI-WIC as 65 inches-8
  Stature of 46 inches-enter on MI-WIC as 46 inches- 0

Head Circumference

- Enter inches and fraction in sixteenths**
- Use 2 digits for inches and for fraction
- Example: Head circumference of 13 12/16 inches-enter on MI-WIC as 13 inches-12
  Head circumference of 15 5/8 inches-enter on MI-WIC as 15 inches-10

**If measurement values are in eights, it is necessary to convert values to sixteenths.

1/8 inch - enter as 02 (2/16)
2/8 inch - enter as 04 (4/16)
3/8 inch - enter as 06 (6/16)
4/8 inch - enter as 08 (8/16)
5/8 inch - enter as 10 (10/16)
6/8 inch - enter as 12 (12/16)
7/8 inch - enter as 14 (14/16)

APPENDIX C: RECORDING MEASUREMENT VALUES - continued

SUMMARY TABLE

Measurement	Recording Form	Data Entry
Weight: Infant Scale	• record actual values in 1/8, 1/4, or 1 ounce intervals*. • write values in pounds, ounces and fractions. • EXAMPLE: weight of 20 pounds and 13 3/8 ounces record as 20-13 3/8. _____ *Depending on the sensitivity of the scales.	• enter actual pounds , ounces, and round ounce fraction to nearest ounces. • EXAMPLE: actual weight of 20 lbs and 5 3/8 ounces, enter as 20 pounds-5 ounces.
Weight: Adult Scale	• record actual values in 1/4 pounds intervals. • write values in pounds and fractions. • EXAMPLE: weight of 52 and 3/4 pounds record as 52 3/4.	• enter actual pounds and ounces. • EXAMPLE: actual weight of 52 and 3/4 pounds, enter as 52 pounds-12 ounces.
Length/Stature	• record actual values in 1/16 inch intervals. • write values in inches and fractions. • EXAMPLE: 24 and 4/16 inches record as 24 4/16.	• enter actual inches and fraction. • EXAMPLE: actual length of 24 and 4/16 inches, enter as 24-4.
Head Circumference	• record actual value in 1/16 or 1/8 inch intervals. • write values in inches and fraction. • EXAMPLE: 13 and 13/16 inches record as 13 13/16.	• enter actual inches and fraction in sixteenths. • EXAMPLE: actual head circumference of 13 and 13/16 inches, enter as 13-13.

APPENDIX D: GUIDE FOR ROUNDING MEASUREMENT VALUES FOR GROWTH CHART PLOTTING

The placement of actual weight, length or stature, and head circumference values on the appropriate growth charts can be difficult to estimate. Listed below is a guide for rounding measurement values for growth chart plotting.

1. Rounding Length and Stature Fractions

   16 gradations per inch

1/16 through 2/16 inch	-	drop
3/16 through 5/16 inch	-	round off to 1/4 inch
6/16 through 10/16 inch	-	round off to 1/2 inch
11/16 through 13/16 inch	-	round off to 3/4 inch
14/16 through 15/16 inch	-	round off to next higher inch

   8 gradations per inch

1/8 inch	-	drop
2/8 inch	-	reduce to 1/4 inch
3/8 inch through 5/8 inch	-	round off to 1/2 inch
6/8 inch	-	round off to 3/4 inch
7/8 inch	-	round off to next higher inch

2. Rounding Weight Values on WHO Birth < 24 Months of Age Growth Chart

   Step 1. Round fractional ounces to nearest ounce.
   (1/2 ounce or less-round down, over 1/2 ounce-round up).

   Step 2. Round ounces to nearest one quarter pound as follows:

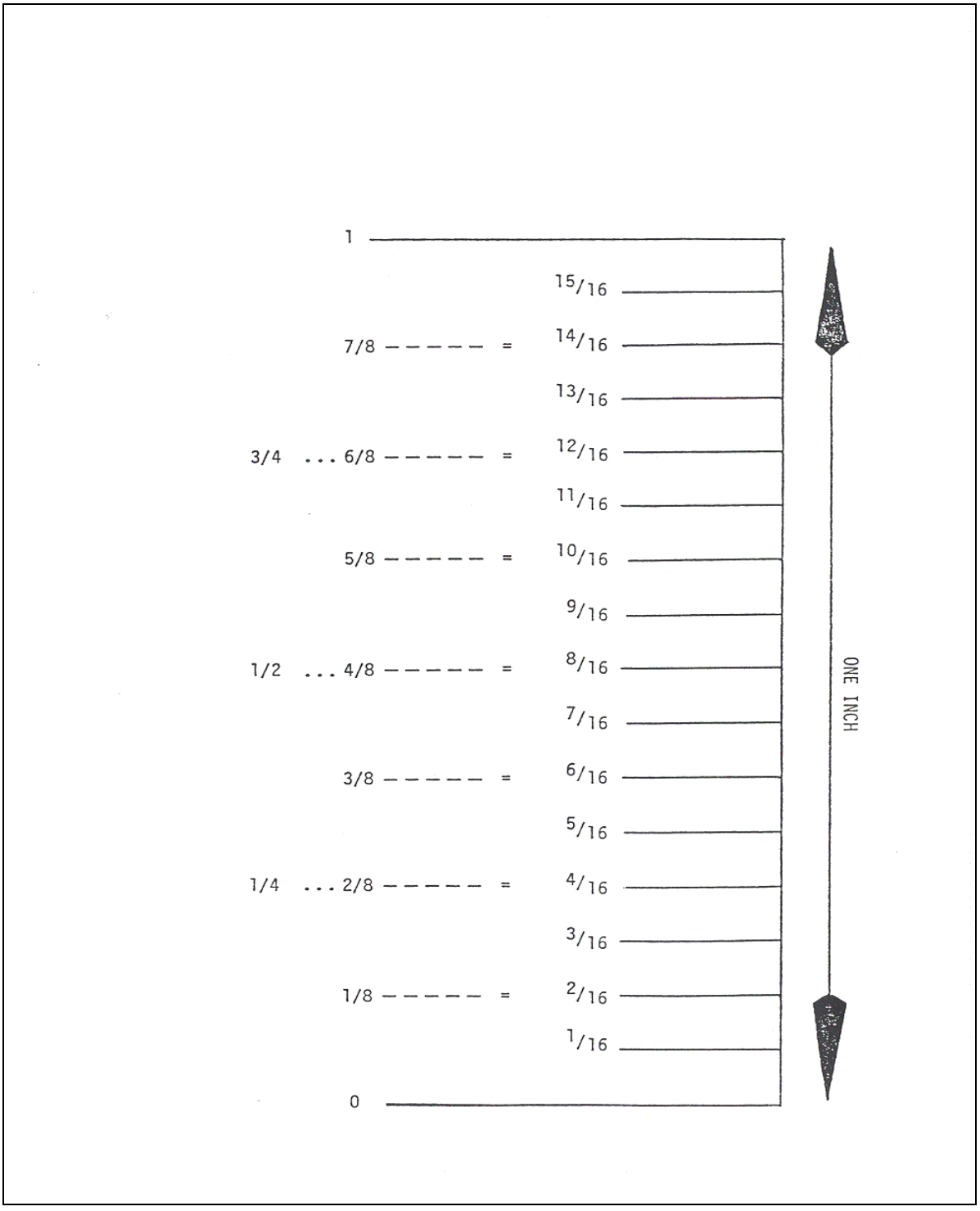
1 through 2 ounces	-	drop
3 through 5 ounces	-	round off to 1/4 pound
6 through 10 ounces	-	round off to 1/2 pound
11 through 13 ounces	-	round off to 3/4 pound
14 through 15 ounces	-	round off to next higher pound.

3. Rounding Weight Valued on 2 to 5 Years of Age Growth Chart

   Round fractional pound to nearest pound.
   (1/2 pound or less-round down, over 1/2 pound-round up).

APPENDIX E: GUIDE FOR UNDERSTANDING MEASUREMENT LINES ON A RULER OR TAPELINE

Sample below is a mock-up of an inch increment of a ruler showing 1/16, 1/8 and 1/4 subdivisions.



APPENDIX F: GUIDE FOR INTERPRETING AND CONVERTING FRACTIONS

Converting Fractions to Decimals for Calculating BMI

FRACTIONS			DECIMAL
1/16	2/16	1/8	0.1
	3/16		0.2
4/16	5/16	1/4	0.3
6/16	7/16	3/8	0.4
	8/16	1/2	0.5
9/16	10/16	5/8	0.6
	11/16		0.7
12/16	13/16	3/4	0.8
14/16	15/16	7/8	0.9

Note: Use decimal values for fractions in the BMI equation below. Use table to the left to convert measurement fractions to decimal values. For example: a stature measurement of 37 10/16 inches becomes 37.6 inches.

BMI = [Wt.(lbs.) ÷Ht.(in.) ÷Ht.(in.)] x 703

Fractional inches and their equivalents

1/16" = 1/16"
2/16" = - - - - = 1/8"
3/16" = 3/16"
4/16" = - - - - = 2/8" - - - = 1/4"
5/16" = 5/16"
6/16" = - - - - = 3/8"
7/16" = 7/16"
8/16" = - - - - = 4/8" - - - = 2/4" - - - = 1/2"
9/16" = 9/16"
10/16" = - - - - = 5/8"
11/16" = 11/16"
12/16" = - - - - = 6/8" - - - = 3/4"
13/16" = 13/16"
14/16" = - - - - = 7/8"
15/16" = 15/16"
16/16" = - - - - = 8/8" - - - = 4/4" - - - = 1 in.

Ounces and their equivalents

1 oz. = 1/16 lb.
2 oz. = 2/16 lb. = 1/8 lb.
3 oz. = 3/16 lb.
4 oz. = 4/16 lb. = 2/8 lb. = 1/4 lb.
5 oz. = 5/16 lb.
6 oz. = 6/16 lb. = 3/8 lb.
7 oz. = 7/16 lb.
8 oz. = 8/16 lb. = 4/8 lb. = 2/4 lb. = 1/2 lb.
9 oz. = 9/16 lb.
10 oz = 10/16 lb. = 5/8 lb.
11 oz. = 11/16 lb.
12 oz. = 12/16 lb. = 6/8 lb. = 3/4 lb.
13 oz. = 13/16 lb.
14 oz. = 14/16 lb. = 7/8 lb.
15 oz. = 15/16 lb.
16 oz. = 16/16 lb. = 8/8 lb. = 4/4 lb. = 1 lb.

Fractional Ounces and their equivalents

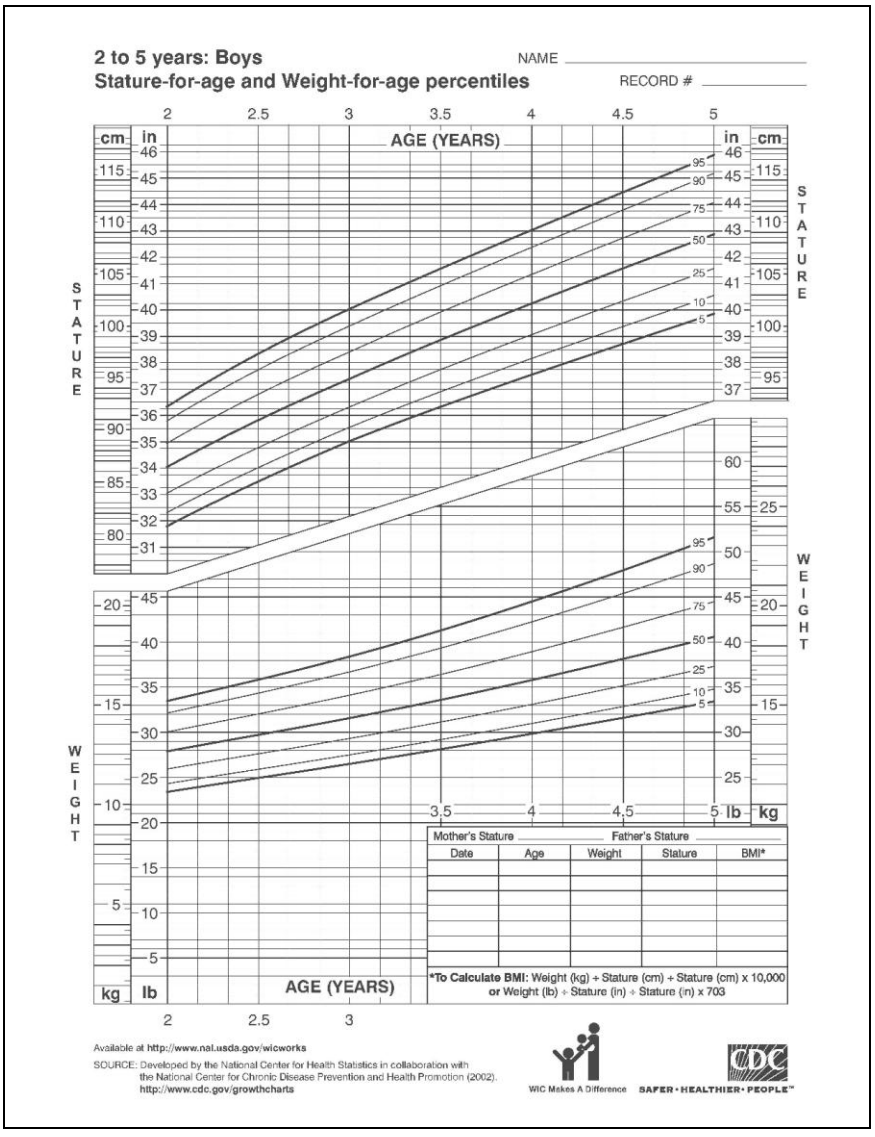
1/8 ounce
2/8 ounce = 1/4 oz.
3/8 ounce
4/8 ounce = 1/2 oz.
5/8 ounce
6/8 ounce = 3/4 oz.
7/8 ounce
8/8 ounce = 1 oz.

APPENDIX G : EXHIBITS OF GROWTH CHARTS

Purpose: To plot physical growth measurements.

Form Design: Single sheet, front and back, 8 1/2 x 11; available - 250 forms/pkg.

Boys (Birth to 36 Months of Age):	Form DCH-0313a
Boys (2 to 5 Years of Age):	Form DCH-0313b
Girls (Birth to 36 Months of Age):	Form DCH-0313c
Girls (2 to 5 Years of Age):	Form DCH-0313d

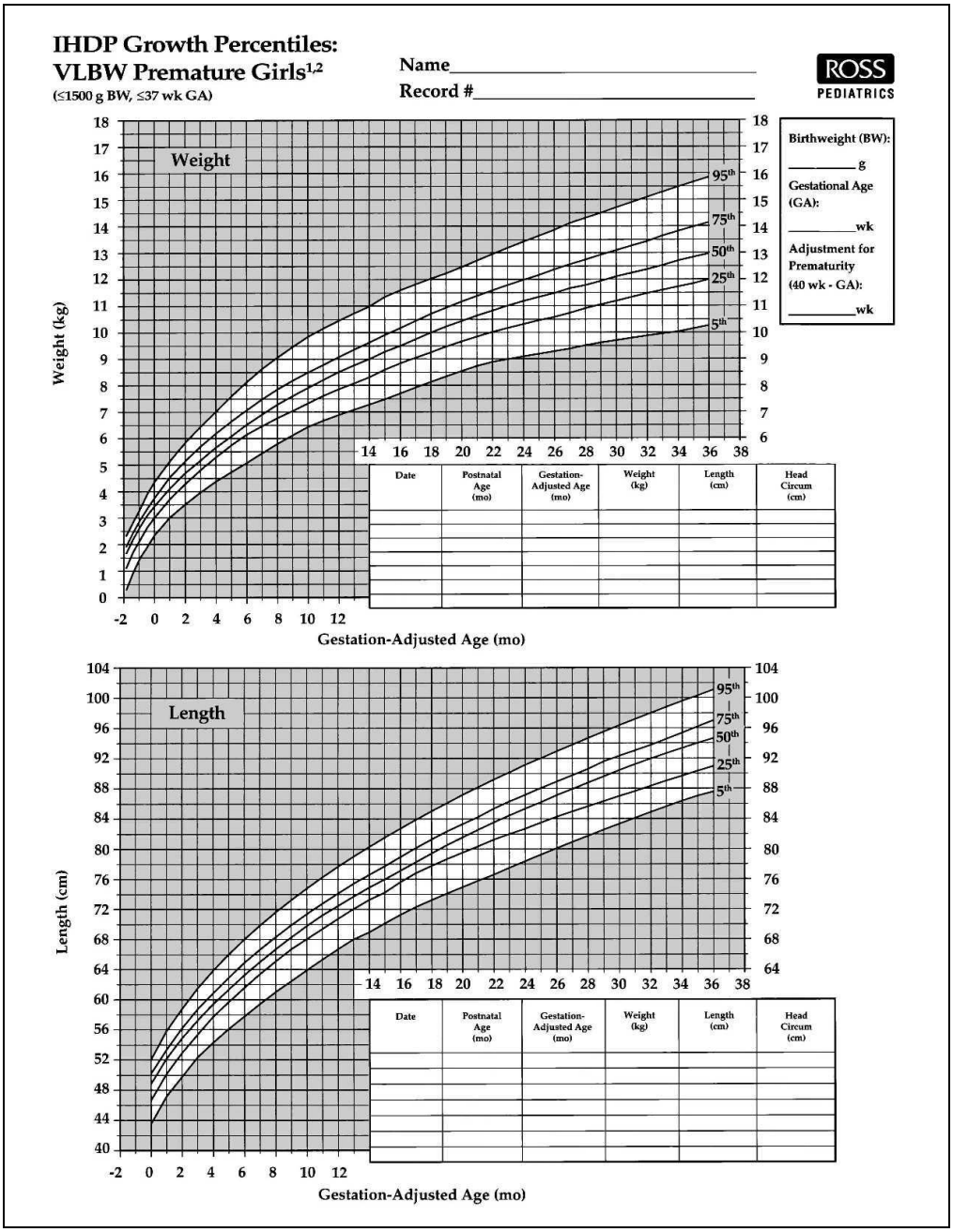


Note: Only the 2-5 chart is illustrated.

APPENDIX G : EXHIBITS OF GROWTH CHARTS - continued

VLBW Boys - IHDP Growth Charts, Ross Pediatrics
VLBW Girls - IHDP Growth Charts, Ross Pediatrics

See illustrated chart on the following page. Note: Only the girls chart is illustrated.



APPENDIX H: SUMMARY OF PLOTTING UNIT INTERVALS FOR CDC-BASED GROWTH CHARTS

GROWTH CHARTS / AGE	LENGTH/ STATURE-FOR-AGE	WEIGHT-FOR-AGE	HEAD CIRCUM.	WEIGHT-FOR-LENGTH/ BMI-FOR-AGE
Birth < 24 Months	1/2 inch	1 pound	1/2 inch	Length: 1 inch Weight: 1 pound
2 to 5 Years	1/4 inch	1 pounds	----------	Age: 1/2 year BMI: .2 BMI unit

WHO GROWTH CHARTS FOR BIRTH < 24 MONTHS

CHART	VERTICAL LINE	HORIZONTAL LINE
Length-for-age	Age: 1 month intervals	Length: 1/2 inch intervals
Weight-for-age	Age: 1 month intervals	Weight: 1 pound intervals
Head Circumference-for-age	Age: 1 month intervals	Head Circumference: 1/2 inch intervals
Weight-for-length	Length: 1 inch intervals	Weight: 1 pound intervals

CDC GROWTH CHARTS FOR BOYS/GIRLS (2 TO 5 YEARS OF AGE)

CHART	VERTICAL LINE	HORIZONTAL LINE
Stature-for-age	Age: 2 month intervals	Stature: 1/4 inch intervals
Weight-for-age	Age: 2 month intervals	Weight: 1 pound intervals
BMI-for-age	BMI: .2 BMI unit	Age: 1/2 year intervals

VLBW GROWTH CHARTS (BIRTH < 24 MONTHS-for Education Purposes)

CHART	VERTICAL LINE	HORIZONTAL LINE
Length-for-age	Age: 1 month intervals	Length: 2 cm intervals
Weight-for-age	Age: 1 month intervals	Weight: 1/2 kg. intervals
Head Circumference-for-age	Age: 1 month intervals	Head Circumference: 1 cm intervals
Weight-for-length	Length: 2 cm intervals	Weight: 1/2 kg. intervals

APPENDIX I: GUIDE FOR PLOTTING AGE ON GROWTH CHARTS

Each set of growth charts has the age line divided into different intervals.

Birth < 24 Months of Age Growth Chart has the age lines divided into one month intervals.

2 to 5 Years of Age Growth Chart has the age lines divided into two month intervals and hatch marks at one month intervals.

Guide for Rounding Off Age to Plot Age or Growth Chart

After calculating the age of the person, locate the age line on the appropriate growth charts. To facilitate the plotting of age, age can be rounded. For the 2 to 5 Chart, round to the nearest year and month by rounding down for days 1-15 and rounding up for days 16 and above. For the Birth < 24 Month Charts, round to the nearest one half month. To round off age to the nearest one half month, follow these rules:

ROUNDING TO THE NEAREST HALF MONTH FOR BABIES 0-36 MONTHS

0-7 Days	Round DOWN to previous month
8-21 Days	Round to 2 month
22-31 Days	Round UP to next month

EXAMPLE: Child's age is 2 months, 15 days
Plotting age is 2 1/2 months.

EXAMPLE: Child's age is 2 months, 23 days
Plotting age is 3 months.

EXAMPLE: Child's age is 4 months, 6 days
Plotting age is 4 months.

EXAMPLE: Child's age is 1 year, 6 months, 28 days
Plotting age is 19 months (1 year, 7 months).

EXAMPLE: Child's age is 4 years, 6 months, 29 days
Plotting age is 4 years, 7 months.

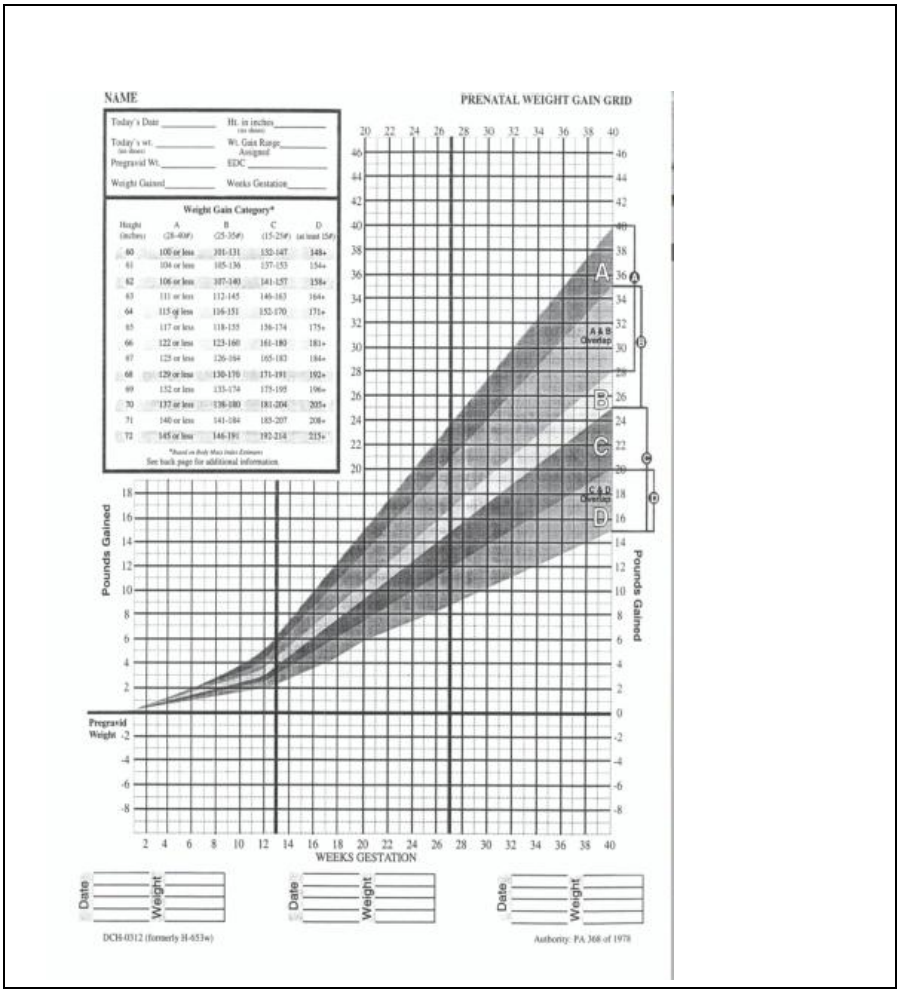
Birth to 36 Months of Age Growth Chart

The location of the age line on this growth chart can either represent the rounded age and use the chart's printed age line which is divided into one month intervals, or the position of actual age is estimated.

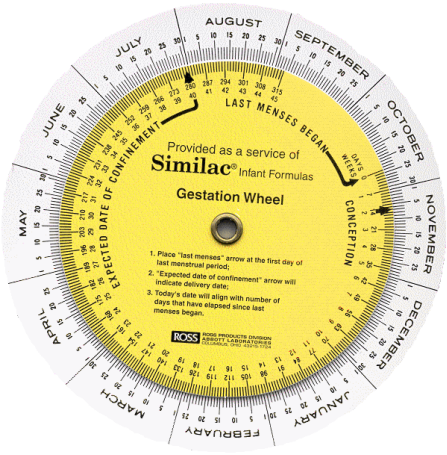
2 to 5 Years of Age Growth Chart

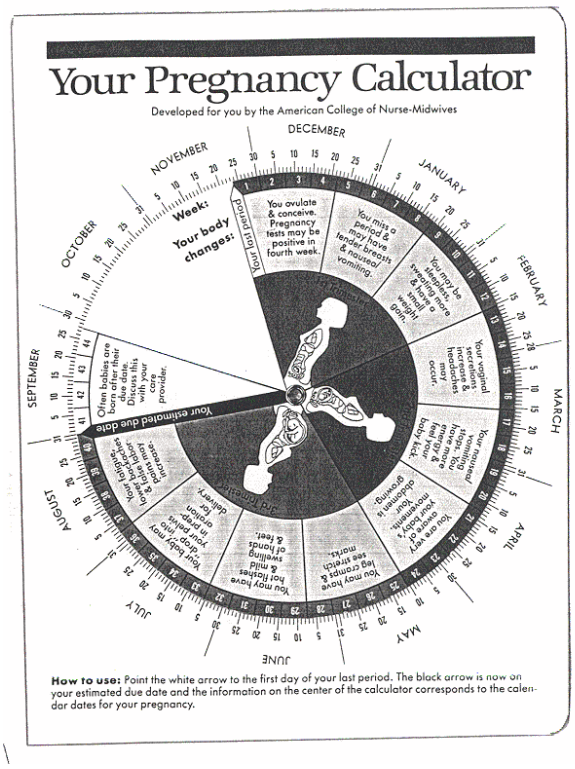
Since the age lines are divided into 6 month intervals, the child's calculated age is rounded to year and nearest month. To locate the position of age on the growth chart, find the child's age in years and estimate position of approximate age in months. The approximate age in months reflects the combination of months plus days rounded to the nearest month.

APPENDIX J: PRENATAL WEIGHT GAIN GRID



APPENDIX K: EXHIBIT OF GESTATIONAL WHEELS





Sources: American College of Nurse-Midwives, 818 Connecticut Avenue, NW, Suite 900, Washington DC 20006; Mead Johnson Pharmaceutical Division; Ross Product Division, Abbott Laboratories.

APPENDIX L: ANTHROPOMETRIC MEASUREMENT PROCEDURE CHECKLIST

WEIGHT

ADULT/CHILD

___ 1. Remove shoes and heavy outerwear and extra clothing of persons two years old or older.

___ 2. If zero balancing is necessary, move main beam and fractional weights to zero and see if indicator is reading zero. If not, adjust zeroing weight.

___ 3. Have the person step onto the **middle** of the scale platform.

___ 4. Adjust main beam weight one notch too heavy, then move it back (left) one notch. Adjust fractional beam weight to balance. State the measurement out loud.

___ 5. Record this weight reading to the nearest 1/4 pound.

___ 6. Have the person step off the scale, or return weights to zero.

___ 7. Return the main beam and fractional beam weights to zero.

___ 8. Re-weigh (repeat steps 3 through 6).

___ 9. Compare the first and second weights. If they are not within 1/4 pound of each other, repeat steps 3 through 6 until you have two weights within agreement.

__ 10. Record the final accepted (confirming) weight on the form.

INFANT

___ 1. Child is less than two years of age.

___ 2. Remove all clothing, except a dry diaper and light clothing such as one thin undershirt.

___ 3. Place a disposable sheet and medium dry diaper onto the scale and check the zero balance indicator, if necessary. Move the main beam and fractional beam weight to zero to check the balance. If it is not in balance, adjust the zero adjustment weight.

___ 4. Remove the dry diaper. Place the infant in the middle of the scale's pan on the sheet. **Do not touch the child. Do not allow the child to hold onto the part of the scale that would interfere with the accurate weight.**

___ 5. Adjust the main beam weight until the indicator goes all the way down, then move it back one notch.

___ 6. Move the fractional beam weight until the indicator is centered. State the measurement out loud.

___ 7. Record the weight in pounds and ounces to the nearest 1/8 ounce, 1/4 ounce, or 1 ounce on the form.

___ 8. Keep the infant on the scale.

___ 9. Return the main beam and fractional beam to the zero position.

___ 10. Repeat steps 5 through 7.

___ 11. Compare the first weight with the second. If they are not within one ounce, repeat steps 4 through 7 until you have two (2) weights within agreement.

___ 12. Record the final accepted (confirming) weight on the form.

HEAD CIRCUMFERENCE

___ 1. Thread the flexible insertion tape so that all words on the wide end of the tape show.

___ 2. Place the infant flat on his/her back or in a sitting position. You may want someone to hold the infant.

___ 3. Position the tape on the infant's head covering the fullest circumference of the head: above the eyebrows, above the ears, over the fullest part of the head back.

___ 4. Position the tape so you are reading it at the side of the head or middle of the forehead.

___ 5. Pull the tape snug and recheck placement.

___ 6. Take the reading at the top line (inch marking) at the arrow indication. State the measurement out loud.

___ 7. Record the reading to the nearest 1/16 inch on the form immediately.

___ 8. Remove the tape from the baby's head without unthreading.

___ 9. Repeat the steps from 3 through 8. Record the second reading.

___ 10. Compare the first and second readings. If they are not within 2/16, repeat steps 3 through 8 until there is an agreement between the readings.

___ 11. Record the final accepted (confirming) reading on the form.

HEIGHT

STATURE

Tape Installation:

___ 1. Tape line is metal and readable to nearest 1/16 inch.

___ 2. Tape line is attached firmly to a flat surface with clear strapping tape in a straight line, on a wall without extending baseboard.

___ 3. Tape line is attached above an uncarpeted floor or one with indoor/outdoor hard surface.

___ 4. Tape line is attached with "0" at the heel position (at floor), extending upward 84 inches.

___ 5. Right angle headboard and recording form are available.

Positioning Person:

___ 6. Person is two years of age or older.

___ 7. Have person remove shoes and heavy coat, etc.

___ 8. Place person against the wall with heels, buttocks and shoulders touching wall.

___ 9. Eyes straight ahead to prevent head tilt;
- knees are not bent
- arms are straight at sides
- legs are straight
- heels flat on floor
- not leaning on tape line

Taking and Recording the Reading:

___ 10. Pick up right angle headboard.

___ 11. Place the headboard against the wall and lower it until it firmly touches the crown of the head. State the measurement out loud.

___ 12. Recheck that the person has not bent knees or lifted heels off the floor.

___ 13. Hold the headboard in place and with the other hand, push down on person's shoulder; ask him/her to bend knees and step away.

___ 14. Read measurement to the nearest 1/16 inch and record immediately on the form.

___ 15. Repeat steps 8 though 14.

___ 16. Compare the first and second readings. If the second reading agrees within 2/16 of the first reading, record it as the official reading. If the two readings are not within 2/16 of each other, repeat steps 8 through 14 until you have two readings within agreement.

___ 17. Record the final accepted (confirming) reading.

LENGTH

___ 1. Check the equipment for ease of operation, etc.

___ 2. Spread disposable sheet on the recumbent length board.

___ 3. Remove shoes and have feet bare.

___ 4. Place the infant flat on back in the middle of the board with the head at the fixed board position.

___ 5. Position the crown of the head against fixed headboard, with vision upward. Have an assistant help you. Demonstrates how to hold head.

___ 6. Hold knees together and firmly press downward to fully extend the infant.

___ 7. With the infant held in position, slide the footboard up until both heels touch and feet are flat against board.

___ 8. Immediately read measurement out loud and record to nearest 1/16 inch or 1/8 inch on the form.

___ 9. Keep the child in the middle of the board and slide the foot board away from the feet.

___ 10. Repeat steps 5 through 8. Record the second reading.

___ 11. Compare the first and second readings. If the second reading is within 2/16 or 1/8 inch of the first, record it as the official reading. If the two readings are not within 2/16 or 1/8 inch of each other, repeat steps 4 through 8 until two readings are within 2/16 inch or 1/8 inch of each other.

___ 12. Record the final accepted (confirming) reading.

APPENDIX M: INSTRUCTIONS FOR USING "MINIMUM EXPECTED WEIGHT GAIN TABLES" ALOOKUP METHOD@ FOR INADEQUATE GROWTH

Note: Tables adapted from Colorado WIC

The following tables are used to determine the "minimal expected weight gain" for an infant or child. If an infant or child has a weight gain for a period of time that is less than the number derived from the chart, then they should be risked with **Inadequate Growth.** All numbers in the tables are given in ounces.

NOTE: If an infant or child is maintaining their growth percentile without a decrease, there is no reason to do the following calculation. An infant or child maintaining their growth percentile has adequate growth (with respect to the nutrition risk factors).

Step 1: Determine the infant/child's actual weight gain since their last visit.

Convert this number to ounces using the conversion table. Convert today's weight to ounces using the conversion table. Convert the previous weight to ounces using the conversion table. Subtract the previous weight from today's weight.

Step 2: Find the table that has this infant/child's age at their previous weight on the top line and their current age on the left hand side. Ages should be in months and weeks. The tables use an abbreviation for months and weeks that shows month followed by a decimal and then the number of weeks. For example: 2.3 would indicate an age of 2 months and 3 weeks.

Go down from the age at the previous weight and across from age at the current weight and the number you find is the "minimal expected weight gain." If the number in the box is greater than the actual weight gain, then Inadequate Growth Risk Code 135 should be assigned to the infant/child. If the number is less, then the Risk Code for Inadequate Growth does not apply. If the box is blank where the lines intersect, this method may not be used to determine Inadequate Growth.

The time between weight measurements must be at least one month for infants under 6 months of age, and at least 3 months for infants/children over 6 months of age. Previous weights may not be used if they are more than 7 months old. The weight gain tables are designed so that the boxes are blank for time intervals that do not meet these requirements.

If the time interval from the current weight to the previous weight is too short to meet the minimal interval, you may skip over the previous weight and go to the next previous weight that meets the time interval. You must, however, always use the **current weight** and the **most recent previous weight** that **meets the minimal time interval**. You may not skip weights that meet the interval in order to find a weight that will risk the infant/child.

Example 1

An infant is originally weighed for certification on the WIC Program at 2 weeks (0.2) of age. The infant is now in the clinic at 3 months and 1 week of age (3.1).

Weight at 3.1 = 12 pounds 8 ounces = 200 ounces
Weight at 0.2 = 8 pounds 2 ounces = 130 ounces
Weight gain 70 ounces actual weight gain

Table # 1: Go across the top of the chart until you find 0.2. Go down this column until you intersect with the row for 3.1. The minimal expected weight gain is 59 ounces. Because the actual weight gain is greater, the Inadequate Growth Risk Code does not apply.

Example 2

A child is being recertified on the WIC Program at 15 months and 3 weeks. The last previous weight was at a previous recertification at 11 months and 2 weeks.

Weight at 15.3 = 23 pounds 1 ounces = 369 ounces
Weight at 11.2 = 22 pounds 9 ounces = 361 ounces
Weight gain 8 ounces actual weight gain

Table # 6: Go across the top of the chart until you find 11.2. Go down this column until you intersect with the row for 15.3. The minimal expected weight gain is 14 ounces. Since the actual weight is less than the expected weight gain, this child should be assigned the Risk Code 135 for Inadequate Growth.

Example 3

An infant is being mid-cert at 6 months and 2 weeks of age. The most current previous weight was at 4 months and 1 week of age.

Weight at 6.2 = 18 pounds 7 ounces = 295 ounces
Weight at 4.1 = 15 pounds 2 ounces = 242 ounces
Weight gain 53 ounces

Table # 1: Go across the top of the chart until you find 4.1. Go down this column until it intersects with the row for 6.2. There is no minimal expected weight gain listed because this is not an allowed time interval (after 6 months of age the intervals must be at least 3 months between weights). This infant did have another weight at 2 months and 1 week of age. Using this weight we get:

Weight at 6.2 = 18 pounds 7 ounces = 295 ounces
Weight at 2.1 = 14 pounds 9 ounces = 233 ounces
Weight gain 62 ounces

Table 1 does list an expected weight gain for this interval—63 ounces. Since the actual weight gain is less than the expected weight for this infant, Risk Code 135 for Inadequate Growth should be assigned.

This infant could not be assigned Risk Code 135 based on the weights at 4.1 and 2.1 even though they are separated by an allowed interval (the interval is only one month when the infant is under 6 months of age). You must always use the infant/child's current weight and then the most recent previous weight that meets the minimal time interval.

Look at the growth grid for an infant or child to find their age in months and weeks. Weights should be recorded with this information. If an infant or child is maintaining their growth curve percentile, you do not need to assess them for Inadequate Growth. They are growing "normally."

For children over 19 months of age, use Table # 8. The standard for children over 12 months of age is that they should be gaining one pound every 6 months. Table # 8 shows the "expected minimal weight gain" over a 7 month period.

Example 4

A child is being recertified on the WIC Program at 3 years, 9 months and 1 week of age. The child was last weighed at 3 years, 2 months and 3 weeks of age. The time difference between these two weights is 6 months and 3 weeks (this time interval is more than 3 months and less than 7, so it may be used).

Table # 8 shows that the expected weight gain for this period is one pound.
The child's current weight is 33 3 pounds. Their previous weight was 32 : pounds. The difference is 2 pound. This is less than the expected weight gain of one pound, so this child should be assigned Risk Code 135 for inadequate growth.

Minimal Expected Weight Gain

Table #1

	0	0.1	0.2	0.3	1.0	1.1	1.2	1.3	2.0	2.1	2.2	2.3	3.0	3.1	3.2	3.3	4.0	4.1	4.2	4.3	5.0	5.1	5.2	5.3	6.0
1.0	19																								
1.1	25	19																							
1.2	31	26	21																						
1.3	37	32	27	23																					
2.0	46	40	36	31	27																				
2.1	50	45	40	36	31	23																			
2.2	55	49	45	40	36	27	21																		
2.3	59	54	49	45	40	32	26	19																	
3.0	65	59	55	50	46	37	31	25	19																
3.1	69	63	59	54	50	41	35	29	23	17															
3.2	73	67	63	58	54	45	39	33	27	21	17														
3.3	77	71	67	62	58	49	43	37	31	25	21	16													
4.0	82	76	72	67	63	54	48	42	36	30	26	21	17												
4.1	85	80	75	71	66	58	52	45	39	34	29	25	20	15											
4.2	89	83	79	74	70	61	55	49	43	37	33	28	24	19	15										
4.3	92	87	82	78	73	65	59	52	46	41	36	32	27	22	18	14									
5.0	97	91	87	82	78	69	63	57	51	45	41	36	32	27	23	19	15								
5.1	100	94	90	85	81	72	66	60	54	48	44	39	35	30	26	22	18	13							
5.2	103	97	93	88	84	75	69	63	57	51	47	42	38	33	29	25	21	16	13						
5.3	106	100	96	91	87	78	72	66	60	54	50	45	41	36	32	28	24	19	16	12					
6.0	110	104	100	95	91	82	76	70	64	58	54	49	45												
6.1	112	106	102	97	93	85	78	72	66	60	56	51	47	42											
6.2	114	109	104	100	95	87	81	74	68	63	58	54	49	44	40										
6.3	116	111	106	102	97	89	83	77	70	65	60	56	51	46	42	38									
7.0	119	114	109	105	100	92	86	79	73	68	63	59	54	49	45	41	37								

Age at first weight is along the top of the table. Age at current weight is along the left side of the table.
(Month. Week) First number is the months. The number of weeks follows the decimal.

Minimal Expected Weight Gain

Table #2

	0.1	0.2	0.3	1.0	1.1	1.2	1.3	2.0	2.1	2.2	2.3	3.0	3.1	3.2	3.3	4.0	4.1	4.2	4.3	5.0	5.1	5.2	5.3	6.0
7.0	114	109	105	100	82	86	79	73	68	63	59	54	49	45	41	37								
7.1	116	111	107	102	94	88	82	75	70	65	61	56	51	47	43	39	35							
7.2		114	109	105	96	90	84	78	72	68	63	59	54	50	46	42	37	34						
7.3			111	107	99	92	86	80	74	70	65	61	56	52	48	44	39	36	32					
8.0				110	101	95	89	83	77	73	68	64	59	55	51	47	42	39	35	32				
8.1					104	97	91	85	79	75	70	66	61	57	53	49	44	41	37	34	30			
8.2						100	93	87	82	77	73	68	63	59	55	51	47	43	40	36	32	29		
8.3							96	89	84	79	75	70	65	61	57	53	49	45	42	38	34	31	28	
9.0								92	87	82	78	73	68	64	60	56	52	48	45	41	37	34	31	28

Table #3

	2.0	2.1	2.2	2.3	3.0	3.1	3.2	3.3	4.0	4.1	4.2	4.3	5.0	5.1	5.2	5.3	6.0	6.1	6.2	6.3	7.0	7.1	7.2	7.3	8.0
9.0	92	87	82	78	73	68	64	60	56	52	48	45	41	37	34	31	28								
9.1		89	84	80	75	70	66	62	58	54	50	47	43	39	36	33	30	28							
9.2			87	82	78	73	69	65	61	56	53	49	46	42	39	36	33	30	28						
9.3				84	80	75	71	67	63	58	55	51	48	44	41	38	35	32	30	28					
10.0					83	78	74	70	66	61	58	54	51	47	44	41	38	35	33	30	28				
10.1						80	76	72	68	63	60	56	53	49	46	43	40	37	35	33	30	28			
10.2							78	74	70	66	62	59	55	51	48	45	42	39	37	35	33	30	28		
10.3								76	72	68	64	61	57	53	50	47	44	42	39	37	35	32	30	28	
11.0									75	71	67	64	60	56	53	50	47	44	42	40	38	35	33	30	28

Age at first weight is along the top of the table. Age at current weight is along the left side of the table.
(Month.Week) First number is the months. The number of weeks follows the decimal.

Table #4

	4.0	4.1	4.2	4.3	5.0	5.1	5.2	5.3	6.0	6.1	6.2	6.3	7.0	7.1	7.2	7.3	8.0	8.1	8.2	8.3	9.0	9.1	9.2	9.3	10.
11.0	75	71	67	64	60	56	53	50	47	44	42	40	38	35	33	30	28								
11.1		73	69	66	62	58	55	52	49	47	44	42	40	37	35	33	30	28							
11.2			72	68	65	61	58	55	52	49	47	44	42	39	37	35	33	30	28						
11.3				70	67	63	60	57	54	51	49	47	44	42	39	37	35	33	30	28					
12.0					71	67	64	61	58	54	52	49	47	44	42	40	38	35	33	30	28				
12.1						67	64	61	58	54	52	50	48	45	43	40	38	35	33	31	29	26			
12.2							65	62	59	55	53	50	48	45	43	41	39	36	34	31	29	26	24		
12.3								62	59	56	53	51	49	46	44	42	39	37	34	32	30	27	25	23	
13.0									60	56	54	52	50	47	45	42	40	37	35	33	31	28	26	23	21

Table #5

	6.0	6.1	6.2	6.3	7.0	7.1	7.2	7.3	8.0	8.1	8.2	8.3	9.0	9.1	9.2	9.3	10.0	10.1	10.2	10.3	11.0	11.1	11.2	11.3	12.0
13.0	60	56	54	52	50	47	45	42	40	37	35	33	31	28	26	23	21								
13.1		57	55	53	50	48	45	43	41	38	36	34	31	29	26	24	22	19							
13.2			55	53	51	48	46	44	41	39	36	34	32	29	27	25	22	20	17						
13.3				54	52	49	47	44	42	39	37	35	33	30	28	25	23	20	18	16					
14.0					52	50	47	45	43	40	38	36	33	31	28	26	24	21	19	17	14				
14.1						50	48	46	44	41	39	36	34	31	29	27	25	22	20	17	15	12			
14.2							49	46	44	41	39	37	35	32	30	27	25	22	20	18	16	13	11		
14.3								47	45	42	40	37	35	32	30	28	26	23	21	18	16	13	11	9	
15.0									46	43	41	38	36	33	31	29	27	24	22	19	17	14	12	10	8

Age at first weight is along the top of the table. Age at current weight is along the left side of the table. (Month.Week) First number is the months. The number of weeks follows the decimal.

Minimal Expected Weight Gain

Table #6

	8.0	8.1	8.2	8.3	9.0	9.1	9.2	9.3	10.0	10.1	10.2	10.3	11.0	11.1	11.2	11.3	12.0	12.1	12.2	12.3	13.0	13.1	13.2	13.3	14.0
15.0	46	43	41	38	36	33	31	29	27	24	22	19	17	14	12	10	8								
15.1		43	41	39	37	34	32	29	27	24	22	20	18	15	13	10	8	7							
15.2			42	40	37	35	32	30	28	25	23	21	18	16	13	11	9	8	7						
15.3				40	38	35	33	31	28	26	23	21	19	16	14	12	9	9	8	7					
16.0					39	36	34	32	29	27	24	22	20	17	15	13	10	9	9	8	8				
16.1						37	34	32	30	27	25	23	20	18	15	13	11	10	9	9	8	7			
16.2							35	33	31	28	26	23	21	18	16	14	12	11	10	9	9	8	7		
16.3								33	31	28	26	24	22	19	17	14	12	11	11	10	9	9	8	7	
17.0									32	29	27	25	23	20	18	15	13	12	12	11	10	9	9	8	8

Table #7

	10.0	10.1	10.2	10.3	11.0	11.1	11.2	11.3	12.0	12.1	12.2	12.3	13.0	13.1	13.2	13.3	14.0	14.1	14.2	14.3	15.0	15.1	15.2	15.3	16.0
17.0	32	29	27	25	23	20	18	15	13	12	12	11	10	9	9	8	8								
17.1		30	28	25	23	20	18	16	14	13	12	12	11	10	9	9	8	7							
17.2			28	26	24	21	19	16	14	13	13	12	12	11	10	9	9	8	7						
17.3				27	24	22	19	17	15	14	13	13	12	11	11	10	9	9	8	7					
18.0					25	22	20	18	16	15	14	14	13	12	12	11	10	9	9	8	8				
18.1						23	21	18	16	15	15	14	14	13	12	12	11	10	9	9	8	7			
18.2							21	19	17	16	15	15	14	13	13	12	12	11	10	9	9	8	7		
18.3								20	17	17	16	15	15	14	13	13	12	11	11	10	9	9	8	7	
19.0									18	18	17	16	16	15	14	14	13	12	12	11	10	9	9	8	8

Age at first weight is along the top of the table. Age at current weight is along the left side of the table.
(Month.Week) First number is the months. The number of weeks follows the decimal.

Table 8

Use this table for children whose current age is greater than 19 months of age. The first column is the amount of time between weights, and the second column is the "minimal expected weight gain" for that time period. The period of time between weights may not be more than 7 months or less than 3 months.

(Months.Weeks) First number is month. Second number after the decimal is number of weeks.

3.0	½ pound
3.1	½ pound
3.2	½ pound
3.3	½ pound
4.0	½ pound
4.1	½ pound
4.2	½ pound
4.3	½ pound
5.0	¾ pound
5.1	¾ pound
5.2	¾ pound
5.3	¾ pound
6.0	1 pound
6.1	1 pound
6.2	1 pound
6.3	1 pound
7.0	1 pound